REMARKS

Claims 1-28 were pending in this application when the present Office Action was mailed (May 8, 2006). In this response, no claims were amended or canceled, and claims 49-56 have been added. Accordingly, claims 1-28 and 49-56 are presently pending in this application.

In the May 8, 2006 Office Action, all of the pending claims were rejected. More specifically, the status of the application in light of the Office Action is as follows:

(A) Claims 1-9, 11-17 and 19-27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,054,373 to Tomita et al. ("Tomita") in view of U.S. Patent No. 5,762,755 to McNeilly et al. ("McNeilly"); and

(B) Claims 10, 18 and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tomita in view of U.S. Patent No. 6,399,517 to Yokomizo et al. ("Yokomizo").

A. Response to the Section 103(a) Rejection – Tomita and McNeilly

Claims 1-9, 11-17 and 19-27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tomita in view of McNeilly. Applicants respectfully traverse these rejections. For the reasons discussed below, Tomita and McNeilly do not support a *prima facie* case of obviousness over these claims. Accordingly, the Section 103 rejections of these claims should be withdrawn.

Claim 1 is directed toward a method of processing a microfeature workpiece. The method includes supporting a microfeature workpiece by an unheated support in an interior of a processing chamber having a polymeric wall and contacting a surface of the microfeature workpiece with an etchant liquid. The polymeric wall of the processing chamber is substantially non-reactive with the etchant liquid. The method also includes heating the etchant liquid by delivering radiation from a radiation source through the wall of the processing chamber to heat the etchant liquid. The polymeric wall is more transmissive of an operative wavelength range of the radiation than the etchant liquid; thereby a temperature of the etchant liquid is increased more rapidly than a temperature of the polymeric wall. The method further includes controlling the radiation source to maintain a temperature of the etchant liquid at or above a target process

temperature to etch the surface of the microfeature workpiece and removing the etched microfeature workpiece from the processing chamber.

Tomita discloses an apparatus for removing metallic impurities diffused in a semiconductor substrate. The apparatus includes a quartz beaker 21, a quartz holder 22 for holding a silicon substrate 23 in the quartz beaker 21, a chemical liquid in the quartz beaker 21, and an external infrared heater 24 for heating the silicon substrate 23. The infrared heater 24 heats the inside of the substrate 23 to as high a temperature as possible to remove impurities from the substrate 23. The substrate temperature should be at least 200°C and as high as possible as long as the temperature is lower than the boiling point of the chemical liquid (column 7, lines 33-35). The highest treatment temperature in the case of the chemical agent is about 290°C to 350°C for sulfuric acid (column 5, lines 62-64).

McNeilly discloses a method for achieving greater uniformity and control in vapor phase etching of silicon (Abstract). In particular, McNeilly discloses an apparatus that includes an important window assembly 9 that has an upper window 10 made from fused quartz and a lower window 8 (column 12, lines 54-60). The two-window assembly is used to assure strength and to allow lower window 8 to be formed from a corrosion resistant material such as Teflon® FEP (column 12, lines 40-42).

Tomita and McNeilly do not support a *prima facie* case of obviousness over claim 1 because (1) there is no suggestion or motivation to modify the references or to combine reference teachings, and (2) there is not a reasonable expectation of success for such a modification.

First, neither Tomita nor McNeilly provides any motivation to combine the reference teachings. Assuming, for the sake of argument, that Tomita's beaker corresponds, at least in part, to the processing chamber of claim 1, Tomita does not teach or suggest that the processing chamber can have a polymeric wall. Tomita actually teaches away from using a processing chamber with a polymeric wall. As described above, Tomita teaches etching a silicon wafer at a temperature at least 200°C and as high as possible so long as the temperature is below the boiling point of the etchant. In one example, the highest treatment temperature in the case of the chemical agent is about 290°C to 350°C when sulfuric acid is used as the etchant. If McNeilly's polymeric material (i.e., FEP) is used to form Tomita's beaker, the FEP material would likely be

deformed if not melted in operation because the melting point for FEP is about 260°C, and the maximum service temperature of FEP is about 204°C. A partially deformed or melted beaker can cause serious safety concerns because the etchant used (e.g., concentrated sulfuric acid) can be highly corrosive and toxic.

As the Examiner correctly pointed out in the present Office Action, Tomita discloses an operating temperature range that is at least 200°C, which can be lower than the 204°C maximum service temperature of FEP. However, it is hard to imagine, if not malpractice, that one skilled in the art would use a material for a critical component of an etching apparatus when the maximum service temperature of the material is only 4°C above the minimum operating temperature of the apparatus given the operating temperature range of 90 to 150°C. The material selection practice suggested by the Examiner disregards reasonable engineering practice. As a result, Tomita does not provide any suggestion or motivation to one skilled in the art for using a processing chamber with a polymeric wall made from a material such as FEP.

McNeilly also does not teach nor suggest that the processing chamber can have a polymeric wall. Assuming, for the sake of argument, that McNeilly's window assembly corresponds, at least in part, to the polymeric wall of claim 1, McNeilly does not disclose or suggest a polymeric window assembly. Instead, McNeilly discloses that the window assembly 9 includes an upper window 10 made from fused quartz and a lower window 8 that can be made from FEP. McNeilly actually teaches away from using a polymeric window assembly because McNeilly discloses that the two-window assembly is used to assure strength. Thus, McNeilly clearly suggests that if the upper quartz window 10 is removed from the window assembly 9, the window assembly 9 might not have sufficient strength. As a result, McNeilly does not provide any suggestion or motivation to one skilled in the art for using a processing chamber having a polymeric wall.

Second, there is no reasonable expectation of success for such a modification because the different operating environment of Tomita and McNeilly. Tomita discloses a liquid etching apparatus that contains a liquid, such as concentrated sulfuric acid. McNeilly, on the other hand, discloses a vapor etching apparatus that contains only a vapor etchant. As one skilled in the art recognizes, the corrosion resistance characteristics of materials can be very different when contacting a liquid instead of a vapor etchant. For example, a material resistant to a gas

substance might not be resistant to a liquid of the same substance. As a result, there is no reasonable expectation of success to replace a component in a liquid etching apparatus with a component from a vapor etching apparatus.

As there is no suggestion or motivation to modify or to combine Tomita and McNeilly; and there is not a reasonable expectation of success for such a modification or combination, Tomita and McNeilly cannot support a *prima facie* case of obviousness of claim 1. Tomita and McNeilly also cannot support a *prima facie* case of obviousness of claims 1-9 because these claims depend from claim 1 and contain additional features.

Claims 11 and 19 contain subject matter generally analogous to that of claim 1. As a result, Tomita and McNeilly cannot support a *prima facie* case of obviousness of claims 11 and 19 for the reasons discussed above and for the additional features of these claims. Tomita and McNeilly also cannot support a *prima facie* case of obviousness of claims 12-17 and 20-27 because these claims depend from claims 11 or 19 and contain additional features.

B. Response to the Section 103(a) Rejection – Tomita and Yokomizo

Claims 10, 18 and 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tomita in view of Yokomizo. Applicants respectfully traverse these rejections. As described above, Tomita fails to teach or suggest at least one feature of claims 1, 11, and 19, and Yokomizo fails to fill this void. Accordingly, the combined teachings of Tomita and Yokomizo cannot support a *prima facie* case of obviousness over claims 10, 18, and 28 for the reasons discussed above and for the additional features of these claims.

C. Newly Added Claims

Claims 49-56 have been added in this response. The combined teachings of Tomita, McNeilly, and/or Yokomizo cannot form the basis of Section 102 or Section 103 rejections of these claims because these references fail to teach or suggest several features of claims 49-56. For example, none of these references disclose or suggest "increasing a temperature of the etchant liquid more rapidly than a temperature of the polymeric wall by delivering radiation to the etchant liquid from a radiation source and through the polymeric wall of the processing chamber."

D. Conclusion

In view of the foregoing, the claims pending in the application comply with the requirements of 35 U.S.C. § 112 and patentably define over the applied art. A Notice of Allowance is, therefore, respectfully requested. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the Examiner is encouraged to call the undersigned representative at (206) 359-6038.

Respectfully submitted,

Perkins Coie LLP

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Chen Liang
Registration No. 51,945

Correspondence Address:
Customer No. 25096
Perkins Coie LLP
P.O. Box 1247
Seattle, Washington 98111-1247
(206) 359-8000